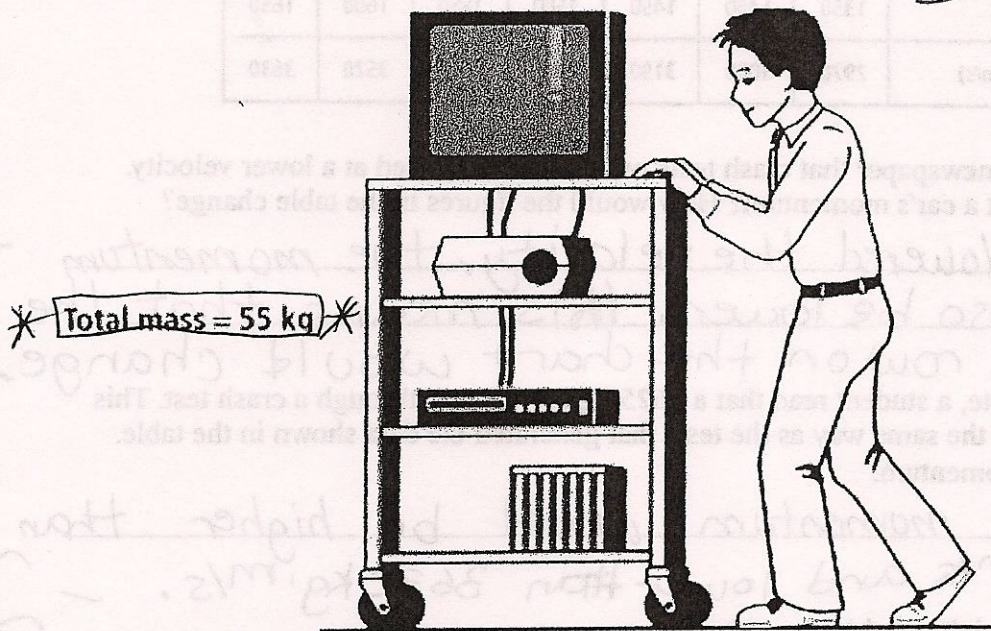


Math in Science

Using the drawing, answer the following questions. (8 points each)

11. Newton's second law is often written as $F = ma$. How does this law describe the relationship among force, mass, and acceleration?

This law shows that mass and acceleration are needed to find force.



12. Calculate the force needed to accelerate the video cart 2.0 m/s^2 . The formula for calculating force is $F = ma$.

$$f = ma = 55 \text{ kg} \cdot 2 \text{ m/s}^2 = 110 \text{ N}$$

13. Another piece of equipment is added to the cart, making its total mass 60 kg . If the cart is accelerating at 3.0 m/s^2 , what is the force being applied to the cart? The formula for calculating force is $F = ma$.

$$f = ma = 60 \text{ kg} \cdot 3 \text{ m/s}^2 = 180 \text{ N}$$

14. A student applies a force of 85 N to the cart. What is the acceleration of the cart?

The formula for calculating acceleration is $a = \frac{F}{m}$.

$$a = \frac{F}{m} = \frac{85 \text{ N}}{55 \text{ kg}} = 1.54 \text{ m/s}^2$$